



U.S. DEPARTMENT OF COMMERCE
National Oceanic and Atmospheric
Administration
NATIONAL WEATHER SERVICE
1325 East-West Highway
Silver Spring, Maryland 20910-3283

MEMORANDUM FOR: Distribution

FROM: W/OPS2 – John Van Kuren

SUBJECT: Operational Test and Evaluation (OT&E) for the
Automated Surface Observing System (ASOS) CL31 Replacement
Ceilometer, and ASOS Acquisition Control Unit Version (V) 2.79S
with Data Collection Platform V2.0 Erasable Programmable Read
Only Memory

Attached, for your information, is the official subject OT&E plan.

The ASOS CL31 Replacement Ceilometer, and ASOS Acquisition Control Unit (V) 2.79S with Data Collection Platform V2.0 OT&E plan was coordinated through the ATRB including, NWS regional headquarters focal points, U.S. Air Force (USAF) focal points, and U.S. Navy focal points. The official plan is posted at:

http://www.nws.noaa.gov/ops2/ops24/documents/asos_ceilometer.htm

A Test Review Group (TRG), as constituted in the OT&E plan and chaired by the Test Director, will oversee the conduct of the OT&E, adjudicate and prioritize for fixing any reported problems, as well as judge the overall performance of the system under test. Prior to the official start of OT&E, an OT&E “kick off” meeting will be conducted with the TRG to ensure all prerequisites are met.

The OT&E will commence upon successful completion of the System Test (ST) and approved by the ATRB. The OT&E is scheduled to last for approximately three months at 22 operational ASOS sites. These sites were selected to validate the replacement ceilometer operations with a wide variety of communication configurations, hardware configurations, climatic regions, and represent each of the Government agencies supporting ASOS, in conjunction with ASOS Acquisition Control Unit (ACU) V2.79S and Data Collection Platform (DCP) V2.0 Erasable Programmable Read Only Memory (EPROM).

For the first part of OT&E, at most OT&E sites, the CL31 ceilometer will be installed (on the temporary mount or spare pedestal) and configured as the test sensor, and the current ASOS CT12K sensor will be configured as the primary (operational) sensor. For the second part (at a time to be determined at a later date) of the OT&E, the ET's will dial-in to the site, configure the CL31 ceilometer as the primary (operational) sensor, and configure the CT12K ceilometer as the test sensor.



Evaluation of ASOS performance at the OT&E sites will be performed in accordance with the methodology presented in the OT&E plan and will continue for approximately three months after a site's installation is complete.

At the end of the OT&E, the Test Director will present to the ATRB the test results along with the TRG's OT&E recommendation for review and approval. The ATRB will vote on whether OT&E was successful. The Chair, ATRB will inform the Chair, ASOS Configuration Control Board (ACCB) of the ATRB's decision. The ATRB will use the results of the OT&E as input to its decision for national deployment of the CL31 ceilometer, and ASOS ACU V2.79S and DCP 2.0 EPROMS at all operational ASOS sites.

If you have any questions or comments, please contact the Test Director:

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OPERATIONAL TEST AND EVALUATION (OT&E) PLAN

For
Automated Surface Observing System
(ASOS) CL31 Ceilometer Replacement
And
ASOS Acquisition Control Unit Version (V)
2.79S with Data Collection Platform V2.0
Erasable Programmable Read Only Memory
Addendum
CT12K and CL31 Ceilometers
Meteorological Comparison Evaluation Plan

November 2008

U.S. DEPARTMENT OF COMMERCE
National Oceanic and Atmospheric Administration
National Weather Service/Office of Operational Systems
Field Systems Operations Center/Test and Evaluation Branch

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Executive Summary

This document describes the Operational Test & Evaluation (OT&E) for the Vaisala replacement ceilometer (CL31) on the Automated Surface Observing System (ASOS) using the Acquisition Control Unit (ACU) Version (V) 2.79S and Data Collection Platform (DCP) V2.0 Erasable Programmable Read Only Memory chips (EPROMs). The purpose of the OT&E is to confirm the suitability of the replacement ceilometer and supporting ASOS software for operational use at ASOS locations under the auspices of the National Oceanic and Atmospheric Administration (NOAA) National Weather Service (NWS), the Federal Aviation Administration (FAA), Department of Defense (DoD) U.S. Air Force (USAF), and DoD U.S. Navy.

The NOAA NWS Office of Operational Systems (OOS), Field Systems Operations Center (FSOC), Test & Evaluation Branch (OPS24) is responsible for the planning, conduct, and reporting of the OT&E. The OT&E for the replacement ceilometer will commence upon approval of the ASOS Test Review Board (ATRB). If the OT&E is successful, the OT&E test director will recommend to the ATRB that the CL31 replacement ceilometers be installed as the operational sensor on ASOS.

Before the start of the OT&E, an OT&E Test Readiness Review (TRR) meeting will be conducted by OPS24 with the ATRB to confirm the prerequisites for OT&E, including an approved OT&E plan, as well as a successful conclusion of a System Test (ST). The ATRB will vote whether to approve commencement of an OT&E. The OT&E will commence immediately after the OT&E Test Review Group (TRG) “kick-off” meeting to verify all pre-requisites for the OT&E are met. The OT&E is scheduled to last for approximately three months at 2 operational ASOS sites selected to validate the replacement ceilometer operations with a wide variety of communication configurations, hardware configurations, climatic regions, and represent each of the Government agencies supporting ASOS.

During OT&E, the replacement ceilometers will be requisitioned from the National Logistics Supply Center (NLSC) in Kansas City, MO, inventoried, and installed by the local ASOS Electronics Technician (ET) using a draft NWS Engineering Modification Note (Mod Note) 92, and then evaluated by local users during operations for approximately three months. The ET’s will also install ASOS ACU firmware V2.79S and DCP V2.0 EPROMS using a draft Mod Note 80. The ETs will evaluate both the delivery of the replacement ceilometers from NLSC and the draft installation instructions (Mod Note 92 and Mod Note 80). Since all OT&E sites are operational, testing will be limited to monitoring CL31 performance during service operations as well as reporting and documenting problems found. The ET’s will be asked to complete a questionnaire about the initial issuance of the CL31 from NLSC, the ease of installation of the replacement ceilometer and ASOS software, their general assessment of the new replacement ceilometer, and comments on the draft technical user manuals for the new CL31 ceilometers. Also, NLSC will be stocked with the requisite number of spares to support the 22 CL31 ceilometer sites during OT&E. During OT&E, if the test sensor fails, the ET will perform unscheduled troubleshooting and corrective maintenance using the draft Vaisala Technical Information (User) Manual, will order the required Lowest Repairable Unit (s) from NLSC, and will evaluate the process as part of the OT&E questionnaire. During OT&E, all ETs will perform preventative maintenance (90-day) on the CL31 also using the draft Vaisala Technical (User) Manual. The ETs will inspect and clean the CL31 window during the 90-day preventative maintenance. The ETs will evaluate the process as part of the OT&E questionnaire.

For the first part of OT&E, at most OT&E sites, the CL31 ceilometer will be installed (on the temporary mount or spare pedestal) and configured as the test sensor, and the current ASOS CT12K sensor will be configured as the primary (operational) sensor. For the second part (at a time to be determined at a later date) of the OT&E, the ET's will dial-in to the site, configure the CL31 ceilometer as the primary (operational) sensor, and configure the CT12K ceilometer as the test sensor.

For OT&E sites with NWS staff, problems found will be identified, documented, and reported on Test Trouble Report (TTR) forms. The NWS site focal point will pass all reported problems and TTR's to the NWS regional focal points. The designated USAF focal point will coordinate all reported problems for the USAF site. The designated U.S. Navy focal point will coordinate all reported problems for the U.S. Navy site. The reported problems from the NWS regional focal points, FAA, USAF, and U.S. Navy focal points will be forwarded to the OT&E test director who will enter them into the Test Track Pro database. All reported problems will be discussed during the weekly TRG meetings and adjudicated accordingly.

The TRG will manage the OT&E. This oversight group will consist of a representative from each of the four Government agencies, NWS regional headquarters, and OT&E site focal points. The TRG will meet weekly during the duration of the OT&E to review the status of the test and to review, adjudicate, and prioritize fixing of reported problems found during the OT&E (i.e., TTRs). TTRs created during the OT&E will be tracked and archived using the TestTrack Pro database. Each TTR will be classified with a specific priority for fixing and impact to service operations. If no critical problems are found or left unresolved, the OT&E results and TRG's recommendation will be presented by the Test Director to the ATRB for a decision whether the OT&E can be declared successful. The ATRB will notify the ASOS Configuration Control Board (ACCB) of its decision. The ACCB will use the ATRB's decision as input into whether to implement the Request for Change on the ASOS Replacement Ceilometer and deploy the CL31 as the operational ceilometer on all ASOSs.

Additionally, a CT12K (current operational ASOS sensor) and CL31 ceilometers meteorological comparison evaluation may be performed in parallel to this OT&E. This evaluation commenced during the System Test (ST). The ATRB may approve continuation of the evaluation into the OT&E. The purpose of this evaluation is to document meteorological reporting differences (cloud height and amount) between the two ceilometers when configured on the same ASOS. An analysis team will evaluate these differences using ASOS data collected remotely. If significant differences are found, or if significant differences can be satisfactorily explained, the team will propose that any significant meteorological differences be documented in a Technical Implementation Notice (TIN) issued by NWS headquarters prior to the CL31 being switched to the primary (operational) sensor at OT&E sites. This information will be propagated by a Public Notification Statement (PNS) issued by the Weather Forecast Offices (WFO) as the switch occurs at the ASOS's within their County Warning Areas (CWA). If the analysis team cannot explain significant differences that might adversely affect Terminal Aviation Forecasts (TAF) and general aviation safety, these problems will be provided to the OT&E TRG, and assigned an operational impact and priority to fix according to the scheme provided in the OT&E plan. If the TRG assigns a difference with an impact and priority as critical to service operations, it could suspend the OT&E until a fix is found. If a consensus

cannot be reached, the problem will be forwarded to the ATRB for resolution. The evaluation plan should be referenced for details (See *CT12K and CL31 Ceilometers Meteorological Comparison Evaluation Plan*, October 2008)

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Acronyms

ACU	Acquisition Control Unit
ACCB	ASOS Configuration Control Board
ADAS	AWOS/ASOS Data Acquisition System
AFB	Air Force Base
ALDARS	Automated Lightning and Detection Reporting System
AOMC	ASOS Operations Monitoring Center
ASN	Agency Stock Number
ASOS	Automated Surface Observing System
ATIS	Automatic Terminal Information System
ATRB	ASOS Test Review Board
AWOS	Automated Weather Observing System
CD	Compact Disc
CL31	Vaisala CL31 Replacement Ceilometer
CT12K	Current Vaisala 12K Ceilometer
CWA	County Warning Area
DCP	Data Collection Platform
DoD	Department of Defense
EMRS	Engineering Management Reporting System
EPROMs	Erasable Programmable Read Only Memory (chips)
ESA	Electronic System Analyst
ET	Electronic Technician
FAA	Federal Aviation Administration
FTI	Federal Telecommunication Infrastructure
FTP	File Transfer Protocol
GTA	Ground-To-Air
ISSO	Information System Security Officer
LRU	Lowest Repairable Unit
Mod Notes	NWS Engineering Modification Notes
NASEO	National Airway System Engineering Office
NCAR	National Center for Atmospheric Research
NLSC	National Logistics Support Center
NOAA	National Oceanic and Atmospheric Administration
NRC	National Reconditioning Center
NWS	National Weather Service
NWSEO	National Weather Service Employees Organization
NWSTC	National Weather Service Training Center
OIC	Official In Charge
OT&E	Operational Test and Evaluation
OOS	Office of Operational Systems
OPL	Observations Program Leader
OPS24	Office of Operational Systems, Test & Evaluation Branch
OST	Office of Science and Technology
PNS	Public Notification Statement
RC	Request for Change

SCA	Single Cabinet Assembly
SFSC	Sterling Field Support Center
SIO	Serial Input Output
SPAWARSYSCEN	U.S. Navy Space and Naval Warfare Systems Center
ST	System Test
TAF	Terminal Aviation Forecast
TIN	Technical Implementation Notice
TRG	Test Review Group
TRR	Test Readiness Review
TTR	Test Trouble Report
USAF	United States Air Force
WFO	Weather Forecast Office
WSH	National Weather Service Headquarters
WSP	Weather Systems Processor

1. Introduction

The cloud height indicator sensor deployed on the Automated Surface Observing System (ASOS) is the Vaisala CT12K ceilometer. This sensor detects clouds to 12,500 ft, and reports cloud layers to a height (above ground level) of 12,000 ft. The ASOS Acquisition Control Unit (ACU) software uses data from the cloud height indicator sensor to determine the altitude of the lowest cloud base immediately above the sensor, and after averaging these data for 30 minutes, automatically generates the prevailing sky condition report to a maximum height of 12,000 feet. This report includes heights for, and amounts of, up to the lowest 3 detected layers. The CT12K cloud data are processed by the ASOS Sky Condition Algorithm to produce these sky cover amounts and heights, as well as vertical visibility reports.

In late 1998, Vaisala discontinued production of the CT12K ceilometers with agreement to provide logistical support for the sensor through 2005. The National Weather Service (NWS) National Reconditioning Center (NRC) in Kansas City, MO has enough spare parts in inventory to maintain the sensors for approximately two additional years. Therefore, replacement ceilometers will need to be deployed to the ASOS network by 2009. After several years of testing with multiple vendors, the Vaisala CL31 ceilometer was selected as the replacement ceilometer for ASOS.

Limited production CL31 replacement ceilometers along with ASOS Acquisition Control Unit (ACU) firmware Version (V) 2.79S and Data Collection Platform (DCP) V2.0 Erasable Programmable Read Only Memory chips (EPROMs) will be installed at 22 ASOS Operational Test and Evaluation (OT&E) sites that were chosen for a wide variety of configurations. The site selection was chosen based on the requirement to have: 1) different hardware configurations that includes Single Cabinet Assembly (SCA), single DCP ASOS, and a multiple DCP ASOS with either a backup ceilometer or a meteorological discontinuity ceilometer; 2) a variety of communication configurations including dial-up, Ground-To-Air (GTA), Automated Weather Observing System (AWOS) /ASOS Data Acquisition System (ADAS)/Automated Lightning Detection and Reporting System (ALDARS), Weather Systems Processor (WSP), Automatic Terminal Information System (ATIS), and Federal Telecommunication Infrastructure (FTI); 3) a variety of climatic regions, including sites with severe winter weather that includes snow, ice, wind, extremely cold conditions favorable for the formation of sub-visible ice crystals, desert sites, mountain sites, tropical sites, coastal sites, and continental sites; 4) sites from all NWS regions; and, 5) sites representing the three agencies that use ASOS: NWS, Federal Aviation Administration (FAA), and Department of Defense (DoD) U.S. Navy and U.S. Air Force (USAF).

A Test Request for Change (RC) NWS720 ASOS Ceilometer Replacement was submitted by W/OPS11 on September 24, 2008, and will be approved by the ASOS Configuration Control Board (ACCB) after a successful System Test (ST), and before the start of OT&E. A Test Readiness Review (TRR) will be presented to the ASOS Test Review Board (ATRB) for approval to conduct the OT&E.

1.1 Test Plan Organization

This OT&E Plan is comprised of four sections:

- Section 1 describes the purpose, test objectives and evaluation criteria, test strategy, prerequisites, assumptions, and risks for the OT&E.
- Section 2 describes the CL31 ceilometer and previous testing.

- Section 3 discusses the management of the OT&E including the roles and responsibilities of the personnel participating in the OT&E.
- Section 4 provides details on the conduct of the OT&E including; pre-OT&E activities, resource requirements, Test Review Group (TRG) “kick-off” meeting, evaluation and problem reporting, test schedule, and post OT&E activities.
- Section 5 explains how the test conclusions and final recommendations of the OT&E will be presented.
- Section 6 states the requirement for the OT&E final report.

Included in the OT&E test plan are five Appendices:

- Appendix A - OT&E Site Characteristics.
- Appendix B - Test Trouble Report (TTR) Form.
- Appendix C – Test Review Group (TRG) and ATRB Members.
- Appendix D – Test Personnel
- Appendix E – OT&E Questionnaire

1.2 Purpose

The purpose of the OT&E is to validate the proposed CL31 ceilometer as a replacement for the operational CT12K ceilometer in conjunction with the supporting ASOS firmware V2.79S and DCP V2.0 EPROMs in an operational environment at ASOS sites representing a large variety of communication and climate regimes, prior to and as input to the decision for national deployment of the new sensor. In addition, the OT&E will evaluate the NWS deployment and maintenance strategy including the installation, the logistics sparing, the 90-day preventative maintenance, and the corrective maintenance (as needed) processes.

1.3 Test Objectives and Evaluation Criteria

The OT&E test objectives are to validate:

- A. Installation instructions for limited production CL31 and ACU software/DCP firmware.

Evaluation Criterion: The NWS Engineering Modification Notes (Mod Notes) must be complete and accurate, providing all information required for successful installation. (NOTE: NWS Mod Note 92 will be used to install the CL31 sensor, and NWS Mod Note 80 will be used to install the ASOS ACU firmware V2.79S and DCP V2.0 EPROMS upgrades. (NOTE: The ASOS Monitoring Operations Center (AOMC) down load procedure changes in NWS Mod Note 80.) An overall “Satisfactory” rating must be obtained from the collection of completed questionnaires (Appendix B) for the questions pertaining to this test objective.

- B. Draft Vaisala CL31 Technical (Users) Manual.

Evaluation Criterion: An overall “Satisfactory” rating must be obtained from the collection of completed questionnaires (Appendix B) for the questions pertaining to this test objective (i.e., troubleshooting and corrective maintenance (if required) and 90-day preventative maintenance procedures). Comments will be forwarded to W/OST11 as feedback information to Vaisala. (See section 1.5.2 Assumptions and Limitations).

- C. Delivery of limited production CL31 sensors from Vaisala to the National Logistics Support Center (NLSC) by W/OST11.

Evaluation Criterion: The 22 limited production CL31 sensors and all required ancillary hardware are received, inventoried and stocked by NLSC and are ready for OT&E.

- D. The CL31 sensor deployment process and ASOS DCP V2.0 EPROMS (i.e., “initial issued”) of all required hardware through NLSC to all OT&E sites. [NOTE: The ASOS ACU V2.79S firmware will be distributed by compact disc (CD) rather than by File Transfer Protocol (FTP) on the NWS website (See Section 1.5.2 Assumptions and Limitations)].

Evaluation Criterion: The CL31 ceilometer and all required ancillary hardware (including V2.0 EPROMS), and associated material, are received within a reasonable time by ground transportation at the NWS Weather Forecast Office (WFO), and ready for the Electronic Technicians (ET) to take to the OT&E sites for installation. All items received will be accounted by the ET using an inventory sheet listing all items expected in the shipment. An overall “satisfactory” rating must be obtained from the collection of completed questionnaires for the pertinent question related to this test objective.

- E. Process for repair of failed CL31 field units, if required.

Evaluation Criterion: CL31 ceilometer logistic spares will be stocked at NLSC. If needed, the ET will order spares from NLSC. Repair of failed CL31 sensors, including ordering spares, will be accomplished using normal ASOS repair and replacement procedures. The draft Vaisala Technical (User) Manual will be used for troubleshooting and corrective action procedures (See Test Objectives **B and M**). An overall “satisfactory” rating must be obtained from the collection of completed questionnaires for the pertinent question related to this test objective.

- F. The limited production CL31 sensor, ASOS ACU V2.79S firmware and DCP V2.0 EPROMS do not negatively affect ASOS operational systems.

Evaluation Criteria: Reports (METAR’s, SPECI’s, 5-Minute) must be representative of conditions (within the limitations of the ASOS sensors), correctly formatted, transmitted successfully, and archived in the ASOS database. Also, the ASOS SYSLOG messages generated during OT&E will be compared to the 30-day baseline SYSLOG messages obtained from the 22 OT&E sites prior to the OT&E to ensure no significant increase in SYSLOG messages.

- G. The limited production CL31 sensor must interface properly with ASOS hardware communication types included in the OT&E.

Evaluation Criterion: The test CL31 sensor and backup or meteorological discontinuity CL31 sensors must interface properly with all ASOS hardware configurations including SCA, single DCP, and multiple DCP.

- H. The ASOS ACU V2.79S firmware and DCP V2.0 EPROMS must interface properly with all systems interfaced to ASOS.

Evaluation Criterion: The ASOS software under test must interface properly with all communication configurations including dial-up, GTA, ADAS/ ALDARS, WSP, ATIS, and FTI.

I. ASOS ACU V2.79S firmware and DCP V2.0 EPROMS capability to support either the CT12K or the limited production CL31 sensor as the operational ceilometer on ASOS.

Evaluation Criterion: The 12-hour test sensor (ceilometer) page must be displayed correctly, and update each minute. The 12-hour test (ceilometer) page must also contain ASOS sky condition algorithm output each minute. Configuration of the test and primary (operational) ceilometers, as well as configuring the CT12K and CL31 ceilometers as the operational sensor, must be reflected in the SYSLOG.

J. Process for switching the CL31 ceilometer as the operational ASOS sensor.

Evaluation Criterion: Successful dial in process to configure/de-configure the two sensors, including the successful deployment of the Technical Implementation Notice (TIN) and Public Notification Statement (PNS) to the NWS users ahead of this switch.

K. The limited production CL31 ceilometers are satisfactory as production units for general deployment after OT&E.

Evaluation Criterion: No critical defects with the limited production CL31 ceilometers and its performance are found at the completion of the OT&E. Critical defects are those deficiencies which are deemed by the TRG as adversely affecting the generation of the TAF forecasts and the general aviation safety.

L. AOMC site support

Evaluation Criterion: The trouble tickets opened pertaining to any of the 22 OT&E sites will be collected during the OT&E. All OPEN trouble tickets must be “CLOSED” within the normal time usually assigned based upon the priority of the ticket. An overall “satisfactory” rating must be obtained from the collection of completed questionnaires for the pertinent question related to this test objective.

M. Maintenance process including preventative maintenance and corrective maintenance (if needed)

Evaluation Criterion: The ET’s will perform preventative maintenance at the end of 90 days on the CL31 sensor using the draft Vaisala Technical (User) Manual, including cleaning of the CL31 window, and reporting on the condition of the CL31 window after 90 days. The ET’s will also perform corrective maintenance (if a failure of an LRU occurs during OT&E.) on the CL31 sensor. The ET’s will document preventative and corrective maintenance using the Engineering Management Reporting System (EMRS).

1.4 Test Strategy

The OT&E will be conducted at 22 sites selected to include a variety of hardware and communication interfaces, ASOS hardware and serial configurations, climatic regions, and the participation of the NWS, the FAA, the U.S. Navy, and the USAF organizations. Tables 1 and 2 in Appendix A provide details on operational requirements, communication interfaces, users, etc. for the participating sites.

The OT&E will begin upon approval by the TRG that all pre-requisites for OT&E are met as part of an OT&E “kick-off” meeting. Upon direction of the OT&E test director (See Section 3.2), the ASOS ET, from the WFO or office that is responsible for installation will first install ASOS ACU V2.79S firmware and the DCP V2.0 EPROM following the draft NWS Mod Note 80 (NOTE: The ASOS firmware and NWS Mod Note will be shipped in advance to the NWS ETs. The DCP V2.0 EPROMs will come from the NLSC). This new software is identical to the current operational ACU firmware V2.79E and DCP V1.9 EPROMs with the exception it can support either the existing CT12K ceilometer or the CL31 ceilometer as the ASOS operational sensor. The ET will annotate the NWS Mod Note 80 with any recommended changes during the installation of the ASOS software. (NOTE: The ET will retain the previous version of ASOS software and DCP EPROMs during the OT&E in the event the site needs to revert back to this version as the operational version.)

Once the ASOS software is successfully installed, the ET will “initial issue” the limited production CL31 ceilometer and all required ancillary hardware from NLSC for the ASOS site(s). When the ET receives the CL31(s) and associated hardware, the ETs will install the CL31 ceilometer initially as a test sensor on a temporary mount (See section 4.4 for details) or a spare pedestal on the ASOS rail, using draft Mod Note 92 that was shipped to the ET in advance. The ET will also annotate this NWS Mod Note during the installation process. The sensor will be evaluated as a “test” sensor by the local users for approximately 3 months. Note: The temporary mounts will be installed at the required OT&E sites (i.e., 12 sites) prior to the start of OT&E. These mounts will only be required during the OT&E. Also, two OT&E sites will not need to install the CL31 ceilometer until AFTER the CL31 is officially declared the “operational” ASOS sensor. These two sites will simply swap the current CT12K ceilometer(s) with the CL31 sensor (s). These two sites have a unique configuration of either a meteorological continuity sensor at a remote DCP or a backup sensor at the main DCP. These configurations do not support having the CL31 configured as a “test” sensor.

Since all OT&E sites are operational, testing will be limited to use and performance monitoring of the CL31 ceilometers during service operations as well as reporting and documenting of any problems for the duration of the OT&E.

For the first part of OT&E, at most OT&E sites, the CL31 ceilometer will be installed (on the temporary mount or spare pedestal) and configured as the test sensor, and the CT12K will be configured as the primary (operational) sensor. The decision to switch the CL31 ceilometer to be the operational sensor will be judged upon the performance of the CL31 interface to the ASOS as a “test sensor” and when the announcement to the NWS user community is deemed ready. The announcement will include the switch over date as well as any noteworthy difference found between the CT12K and the CL31 sensor. The evaluation to determine any differences in reported cloud heights and ceilings in ASOS will be performed by parallel meteorological comparison evaluation effort (See the *CT12K and CL31 Ceilometer Meteorological Comparison Evaluation Plan*, which is an addendum to this plan). The results of this evaluation will be provided as input to the ATRB’s decision to switch the limited production CL31 as the operational ASOS ceilometer. For switchover, the ETs will dial-in to the ASOS, configure the CL31 ceilometer as the primary (operational) sensor,

and configure the CT12K ceilometer as the test sensor. This process will be accomplished during “clear” weather conditions.

Due to power and bandwidth considerations, only one test sensor and one operational ceilometer can be configured at one time. At the four OT&E sites with back up or meteorological discontinuity sensors, when the CT12K is the primary (operational) sensor, all back up and meteorological discontinuity sensors must also be CT12Ks. When the CL31 is the primary (operational) sensor, all back up and meteorological sensors must also be CL31s. Therefore, these four OT&E sites will only participate in the second part of OT&E (i.e., CL31 ceilometer is the operational sensor). For these two sites at the start of the second part of the OT&E, the ET will de-configure and remove the CT12K and install and configure the CL31 as the primary (operational) sensor using draft NWS Mod Note 92, and draft Mod Note 80. At that time, the ET will also replace the existing CT12K back up or meteorological discontinuity ceilometer with the replacement CL31 ceilometer on the ASOS pedestal using Mode Note 92. These changes will also be accomplished during “clear” weather conditions.

For sites with NWS staff, problems found will be identified, documented, and reported on TTR forms (See Appendix B). The designated USAF focal point will coordinate reporting of problems for the USAF site. The designated U.S. Navy focal point will coordinate reporting of problems for the U.S. Navy site. All reported problems will be passed to the OT&E Test Director by the NWS, USAF, and U.S. Navy focal points.

A TRG will be established for the duration of the OT&E to oversee the OT&E. All reported problems will be discussed during the weekly TRG meetings and adjudicated. The OT&E Test Director will present OT&E test results and recommendation from the TRG to the ATRB for a decision whether the OT&E was successful. (See Section 3, Test Management).

If at the conclusion of the OT&E, the test is deemed successful, the ASOS ACU firmware and DCP V2.0 EPROMs will remain in the ASOS as the operational software. The limited production CL31 will remain as the ASOS operational ceilometer. If changes are required for the production units, the limited production units at all OT&E sites will be retrofitted to the production standard. If the OT&E is unsuccessful, the ETs will be instructed to revert back to the previous ASOS operational software and the CT12K ceilometers.

1.5 Prerequisites, Assumptions, and Risks

This section describes the actions required before the OT&E, the assumptions and limitations, and a description of the risks associated with performing the OT&E.

1.5.1 Prerequisites

Before proceeding with the CL31 replacement ceilometer OT&E, the following prerequisites include: (Note: The NWS organization responsible for completion of each pre-requisite is denoted in parentheses)

- a. Limited production CL31 replacement ceilometer ST successfully completed (i.e., no critical problems). (W/OPS24)
- b. The temporary mount for the test ceilometer installed at the designated OT&E sites. (NWS

regional headquarters ASOS focal points and ETs)

- c. Drafts NWS Mod Note 92, and NWS Mod Note 80 are available to the NWS ET responsible for each OT&E site. (W/OPS12)
- d. ASOS ACU firmware V2.79S is delivered by CD to the ET's responsible for installing the CL31 ceilometer. (W/OPS24 and W/OPS12)
- e. ASOS DCP V2.0 EPROMS for the OT&E sites are in stock at NLSC. (W/OPS12)
- f. Requisite CL31 hardware (limited production sensors, and all associated hardware) and spares are in stock at NLSC and an inventory list of all items with Agency Stock Number (ASN)s is created for ETs to validate upon receipt of the "initial issue" shipment. (W/OPS14 and W/OST11)
- g. Draft Vaisala CL31 Ceilometer Technical (User) Manual is provided to the ET's. (W/OST11).
- h. Identify for the ETs the Lowest Repairable Units (LRU) required for logistical support of the ceilometers during OT&E. (W/OST11)
- i. The OT&E plan is signed by the Office of Operational Systems, Director, Field Systems Operations Center, after review and comment by the ATRB and NWS ASOS Regional Focal Points. (W/OPS24)
- j. An OT&E TRR and an OT&E "kick-off" meeting has been conducted by OPS24 to confirm with the ATRB and the TRG that the CL31's are ready to begin the OT&E. (W/OPS24)

1.5.2 Assumptions and Limitations

It is assumed that the prerequisites in Section 1.5.1 are met prior to initiation of the OT&E. A limitation of the OT&E is the sites are operational and, since user input is dependent on weather, some user functions may not be exercised during the evaluation period. All screens and user functions, however, were validated during the ST. In addition, users will be able to see the output from the primary sensor (initially CT12K) in the METAR reports, and on the one-minute screen, and see the test sensor output (initially CL31) from the 12-hour archive test ceilometer page.

Another limitation is the ASOS firmware will be delivered to the OT&E sites on CD rather than on the OPS12 website for download. This is necessary to reduce the risk of non-OT&E sites inadvertently downloading V2.79S at an operational ASOS sites.

The ET's will demonstrate the preventative maintenance (90-day) process during OT&E. However, if corrective maintenance is needed (i.e. a LRU fails), the ET will perform corrective maintenance using the instructions in the draft Vaisala Technical (Users) Manual. The CL31 chapter for the NWS S100 Technical Manual will not be available for review during the OT&E. OPS12 will issue the new CL31 chapter for the NWS CL31 S100 Site Technical Manual AFTER OT&E in time for the national deployment phase of the new ceilometer. They cannot complete a draft until they receive the latest Vaisala Technical Users Manual for the production units, which is not expected until after OT&E is completed. The ET's will report preventative and corrective maintenance in EMRS as is

normally required. If corrective maintenance is needed the ET will order the failed LRU “out of stock” from NLSC. There will be no “on-site” sparing during OT&E. The ET’s will order spares from NLSC if needed during OT&E.

1.5.3 Operational Risk

There is some risk that the CL31’s might prove to have performance shortcomings or unforeseen problems that were undetected in previous tests. If a problem occurs with the CL31 ceilometers when they are configured as the test ceilometer, the ET will de-configure and power off the CL31 ceilometer, and reinstall the previous version of ASOS firmware and previous DCP EPROMS. If a problem occurs with the CL31 ceilometers when they are configured as the operational ceilometer, the ET will de-configure and power off the CL31 ceilometer, configure the CT12K ceilometer as the operational ceilometer, and reinstall the previous version of ASOS firmware and previous DCP EPROMS. At sites with CL31 backup or meteorological discontinuity sensors, the ET will also remove the CL31 backup or meteorological sensors, and re-install the CT12K backup or meteorological discontinuity sensors, then reinstall the previous version of ASOS firmware and previous version of DCP EPROMS. Therefore, the ET’s will retain the CT12K ceilometers and previous versions of ACU firmware and DCP EPROMS locally until OT&E is complete.

2. CL31 Replacement Ceilometer Replacement and Previous Testing

The CL31 ceilometer, Figures 1, uses single lens technology to detect cloud bases. The single lens is shared by both the transmitting and receiving units. The transmitter is an Indium Gallium Arsenide pulsed laser diode, operating at a wavelength of 910nm (± 10 nm). The receiving unit is a Silicon Avalanche photodiode with an interference filter typically centered on 915nm. The sensor is equipped with a heater/blower device to keep the window clear of obstructions.



Figure 1: Vaisala Model CL31

The CL31 ceilometer successfully completed both system specification compliance test and a formal System Integration Test (SIT) interfaced to the ASOS test system (ST0) at SFSC, Sterling, VA using ASOS ACU firmware V2.79S and DCP V2.0 EPROMs. The SIT was completed in mid-August 2008. The CL31 ceilometer is now under ST (commenced October 2) in a simulated operational environment at the SFSC. The ST will also include the NWS Training Center (NWSTC), the U.S. Navy Space and Naval Warfare Systems Center (SPAWARSYSCEN), Charleston, SC, and the FAA's National Airway System Engineering Office (NASEO), Weather Sensors and Processors Team, Oklahoma City, OK.

During the remainder of October 2008, the ST will evaluate of draft NWS Mod Note 80 (ASOS ACU Firmware and DCP EPROMs Upgrade) and Mod Note 92 (CL31 Ceilometer Installation), and a limited number of ASOS regression tests to verify the functionality of ASOS with the CT12K configured as the primary (operational) sensor and the CL31 ceilometer configured as the test sensor. These ASOS regression tests will be performed again to verify the ASOS functionality when the CL31 was configured as the primary sensor. In addition, ASOS regression testing will verify the correct remarks are generated for the meteorological discontinuity sensor, and that the backup sensor can replace the primary sensor when the primary sensor failed. The ASOS regression testing includes the ASOS OID keyboard functionality, OID screen display, and user interfaces to ASOS. At the conclusion of the ST, if the CL31 sensors are judged satisfactory by the TRG, the recommendation to proceed to OT&E will be forwarded to the ATRB. The ST plan and the final report will be available at:

http://www.nws.noaa.gov/ops2/ops24/documents/asos_ceilomter.htm

3. Test Management

Overall management of the OT&E is the responsibility of the Test Director:

Joseph Fiore
Test and Evaluation Branch (OPS24)

3.1 TRG and ATRB

The TRG will oversee the conduct of OT&E. The TRG is comprised of subject matter experts (see Appendix C) selected from WSH, NWS Regional Headquarters, the FAA, the U.S. Navy, the USAF, the ASOS Information Systems Security Official (ISSO), and the NWS Employee Organization (NWSEO). The TRG will authorize installation/testing of the CL31's initially as the test ceilometer at the OT&E sites, and may suspend testing at any time, should the performance of the CL31's be found unacceptable. If OT&E testing is suspended, the TRG (with concurrence from the ATRB) will authorize the resumption of testing when the appropriate corrective actions have been taken. The TRG may recommend additional regression tests prior to the resumption of the OT&E.

The TRG will meet weekly during the conduct of the OT&E. The TRG may also meet irregularly or on an emergency basis, if required by the chair, TRG. The TRG meetings will be conducted via teleconference calls and will be coordinated by the Test Director.

Meetings of the TRG are conducted to review, clarify, and validate problems documented by the TTRs. Each problem will be evaluated to determine the priority for fixing and its operational impact. The TRG will work to resolve deficiencies and other test-related issues, and will recommend corrective actions to the ATRB. TTRs created during the OT&E will be tracked and archived using the TestTrack Pro database. Each TTR will be classified with a specific priority for fixing and impact to service operations. TTRs may be assigned numerical scores to indicate the severity of the defect (i.e., the Impact and the Priority). A typical assignment scheme for Impact follows:

Impact 1 - Critical: A repeatable problem that prevents or compromises the full delivery of products or services. No workaround exists for the problem.

Action: The TRG recommends the immediate suspension of OT&E and the System-Under-Test is turned over to the system developers to resolve the problem. The OT&E may be resumed at the recommendation of the TRG after an appropriate fix or workaround has been developed. The TRG may recommend tests be resumed under the existing OT&E Plan; or, if significant recoordination and re-planning are required, the TRG may recommend the OT&E Plan be amended or that a separate Follow-On OT&E Plan be prepared and that tests continue under the new plan. The Test Team may repeat selected Test Case Procedures or develop new Test Case Procedures to fully evaluate the proposed solution.

Impact 2 - Urgent: A repeatable problem that prevents or compromises the full delivery of products or services. A temporary workaround may be implemented to allow continuation of field tests; however the workaround is not acceptable for national deployment. The System-Under-Test may not be implemented without development of a fix or acceptable workaround.

Action: The TRG may recommend that the OT&E continue with the temporary workaround in place. The TRG recommends that an acceptable workaround or fix be developed prior to national deployment of the System-Under-Test. If a fix becomes available during the OT&E, the TRG may recommend immediate implementation of the fix. The Test Team may develop new Test

Case Procedures and/or repeat selected Test Case Procedures to fully evaluate the proposed fix. A Follow-On OT&E may be required to verify the proposed fix.

Impact 3 - Major: A repeatable problem that prevents or compromises the full delivery of products or services. An acceptable workaround has been developed that allows national deployment to proceed.

Action: The TRG may recommend that the OT&E continue with an approved workaround in place until an appropriate fix is developed. If a fix becomes available during the OT&E, the TRG may recommend immediate implementation of the fix. The Test Team may develop new Test Case Procedures and/or repeat selected Test Case Procedures to fully evaluate the proposed fix. A Follow-On OT&E may be required to verify the proposed fix.

Impact 4 - Routine: A repeatable problem that does not prevent or compromise the full delivery of products and services.

Action: The OT&E may continue at the discretion of the TRG. An approved workaround may be authorized until the problem is fixed, but this is not mandatory. Routine deficiencies are documented and prioritized by the proper authority for future fixes.

Impact 5 - Watch Item: Infrequent or poorly documented behavior of the System-Under-Test that might prevent or compromise the delivery of products or services.

Action: The TRG may recommend that the OT&E continue. The Test Team may develop new Test Case Procedures and/or repeat selected Test Case Procedures in an attempt to reproduce the problem. Any further observations are documented and submitted to the TRG for review.

Impact 6 - Potential Enhancement: An item identified by the TRG for consideration as a new system requirement.

Action: The TRG forwards the recommended change to the Program Manager for consideration under the Configuration Management process.

The Priority addresses how the problem is to be resolved. A typical assignment scheme for the Priority follows:

Urgent: Immediate emergency action is required.

Action: All appropriate resources are directed to resolve the problem.

High: Include before national implementation.

Action: The available resources are directed to promptly resolve the problem.

Routine: Acceptable for national implementation.

Action: Resources are directed to resolve the problem as allowed.

Low: Consider for future upgrade to the System-Under-Test.

Action: The item is deferred to future system improvements.

Undetermined: The Priority has not yet been assigned.

Action: None.

If no critical problems are found or left unresolved, the Test Director will present TRG's recommendation to the ATRB for a decision whether the OT&E can be declared successful. The ATRB will notify the ACCB of its decision.

The TRG will also adjudicate and assign impact/priority to problems found and submitted by the data analysis team for the CT12K and CL31 ceilometer meteorological comparison evaluation, for any noteworthy differences in cloud and height reports found deemed to have potential negative affects on TAF operations and aviation safety during the OT&E.

3.2 Test Personnel and Responsibilities

Test personnel are identified in Appendix D. The following are descriptions of each test personnel role and responsibilities:

Test Review Group Chair (W/OPS24) - The Test Director (OPS24) will chair the TRG. The Chair convenes the meetings of the TRG. The Chair works with the TRG to ensure that tests are conducted efficiently and works to resolve any issues that may arise during the conduct of the OT&E.

The Test Review Group Chair is a voting member of the TRG.

Test Director (W/OPS24) - The Test Director will ensure that tests are performed as described in this OT&E Plan. During the OT&E, In addition, the Test Director will:

- Collect and present TTRs to the TRG for classification, and ensure that all TTRs documented and classified during the OT&E are forwarded to the ATRB for resolution.
- Enter all TTRs into the TestTrack Pro database.
- Prepare status reports summarizing TTRs, operational issues, and test completions. Status reports will be distributed to the members of the TRG prior to the weekly meetings.

Following the completion of the OT&E, the Test Director will coordinate a wrap-up meeting to brief the TRG on the status of the tests conducted, summarize the TTRs submitted, and report any other test related issues. The Test Director will submit the TRG recommendation to the ATRB and ensure that the results of the OT&E are properly documented in an OT&E Report.

The Test Director is not a voting member of the TRG

NWS Project Manager (W/OST11) –The NWS Office of Science and Technology (OST11) is the project manager for the CL31 ceilometer replacement effort. The NWS project manager is responsible for support for any issues or technical information, and will coordinate with Vaisala on these matters.

The NWS Project Manager is a voting member of the TRG.

NWS Regional Headquarters ASOS Focal Points – The NWS Regional Headquarters ASOS Focal Points provide liaison between WFOs and WSH. NWS Regional Headquarters Focal Points will participate in meetings of the TRG, coordinate issues, forward TTRs generated at the OT&E sites to the Test Director and work to resolve any problems discovered during tests.

The Regional Focal Points are voting members of the TRG.

USAF Focal Point - The USAF Focal Point serves as a single point of contact for notification of USAF site staff, training of USAF users, collection of trouble reports from the USAF site at Malmstrom Air Force Base (AFB) in Great Falls, MT., and forwarding of trouble reports to the Test Director.

The USAF Focal Point is a voting member of the TRG.

U.S. Navy Focal Point - The U.S. Navy Focal Point serves as a single point of contact for notification of U.S. Navy site staff, training of U.S. Navy users, collection of trouble reports from the U.S. Navy site at Beaufort Marine Corp Air Station, SC, and forwarding of trouble reports to the Test Director.

The U.S. Navy Focal Point is a voting member of the TRG.

OT&E Site Focal Points – For sites with NWS staff, the NWS OT&E Site Focal Points, the Electronic System Analyst (ESA) and Observations Program Leader (OPL) are responsible for coordinating site performance monitoring, for documenting problems on TTR forms (Appendix B), and for forwarding the TTRs to the NWS Regional Headquarters Focal Point who will forward the TTRs to the Test Director.

The OT&E Site Focal Points are not members of the TRG.

NWS Employees Organization (NWSEO) Representative - The NWSEO focal point represents the NWS employee in matters related to work environment.

The NWSEO Representative is a voting member of the TRG.

NWS ASOS Information System Security Officer (ISSO) Focal Point - The ISSO for ASOS is designated with W/OPS22, the Observing Systems Branch. The ISSO will participate in the TRG to evaluate the effect of the change on the security impact on the NWS information systems. The OT&E Director may solicit support from the ISSO, or other designated authority, as required to meet the technical objectives of the OT&E.

The ISSO, or other designated authority, is a voting member of the TRG.

ASOS ATRB – The ATRB will review and approve the test report that documents the TRG test results and recommendation after the OT&E. The ATRB is a board of subject matter experts from each of the participating agencies: NWS, FAA, Department of Defense (DoD) (U.S. Air Force), DoD (U.S. Navy), and an independent consultant from the National Center for Atmospheric Research (NCAR). The ATRB will review, and approve or reject test results and test documentation developed after the OT&E is completed. The ATRB presides over the TRG and the TRG, and has the authority to recommend or reject (by vote) moving from one phase of testing to another.

There are five voting members of the ATRB: NWS, FAA, DoD (U.S. Air Force), DoD (U.S. Navy), and NCAR.

4. Test Conduct

This section describes the:

- pre-installation activities
- resource requirements
- Test Readiness Review,
- installation, evaluation/problem reporting
- OT&E schedule
- help resources
- post-OT&E activities.

4.1 Pre-Installation Activities

For sites with spare pedestals, the CL31 will be installed on the spare pedestal. Some OT&E sites do not have a spare pedestal, and a temporary mount will be required. The temporary mount and associated hardware (see figure 2 for a diagram) will be purchased and

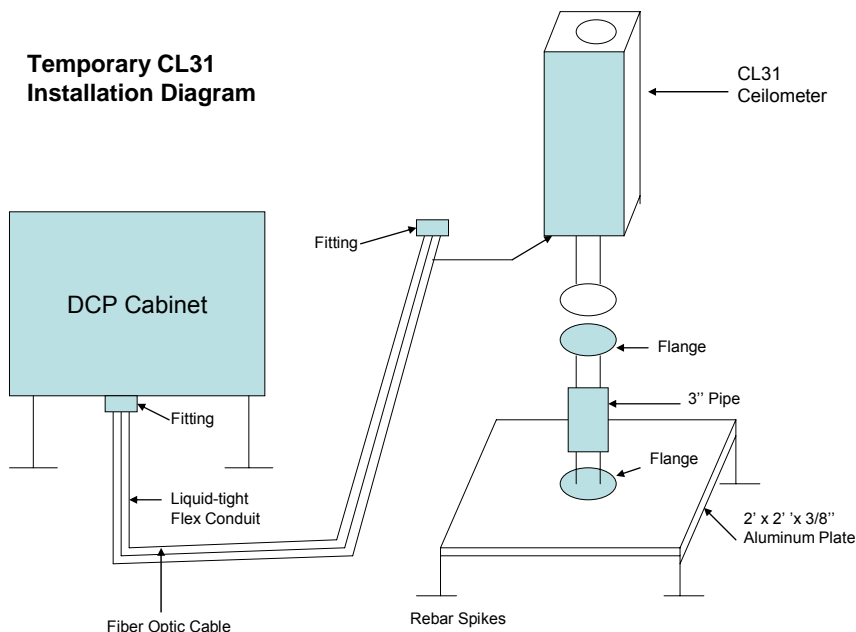


Figure 2-Temporary CL31 Installation Diagram

built locally at each OT&E site with funding provided by the NWS Office of Science and Technology (W/OST11). The temporary pedestal supplies will be purchased and installed in advance of OT&E, so the CL31 sensor is ready to mount on the temporary pedestal at the start of OT&E. The temporary pedestals are not meant to be as stable as permanent pedestals. The design of the pedestal will anchor the 2' x 2' x 3/8" aluminum plate to the ground with rebar rods into holes on each corner of the plate. If needed, especially at sites affected by strong winds, the OT&E site can use sand bags or another type of weight to further stabilize the temporary mount. OST11 is preparing installation instructions and a parts list of required hardware for the temporary pedestal for the ET's. In addition to funds, the installation instructions and parts list will be provided to the ET's prior to the start of OT&E.

The following is a list of specific pre-OT&E activities for sites depending on which Government agency is participating in the OT&E.

For sites with NWS staff, the NWS Site Focal Point will:

- Confirm installation of the temporary mount, if required, has been completed.
- Brief users on the OT&E plan.
- Ensure the ETs have FedEx packages of drafts of NWS Mod Note 80 and 92, ASOS ACU V2.79S CDs, and copies of the DCP V2.0 EPROMs as well as the CL31 ceilometer delivered from NLSC.
- Coordinate with their respective NWS regional focal points during the OT&E if any problems are found during the OT&E.
- Submit completed questionnaires through the NWS regional focal point at the completion of the OT&E

For sites with U.S. Navy staff, the Navy Site Focal Point will:

- Confirm installation of the mount has been completed, if required.
- Ensure the ETs have FedEx packages of drafts of NWS Mod Note 80 and 92, ASOS ACU V2.79S CDs, and copies of the DCP V2.0 EPROMs as well as the CL31 ceilometer delivered from WSH.
- Brief users on the OT&E plan
- Coordinate with the SPAWARSYSCEN Charleston, SC if problems are found during the OT&E.
- Submit completed questionnaires through the SAPWARSYSCEN Charleston, SC at the end of the OT&E

For sites with USAF staff, the USAF Site Focal Point will:

- Confirm installation of the mount has been completed, if required.
- Brief users on the OT&E plan
- Ensure the ETs have FedEx packages of drafts of NWS Mod Note 80 and 92, ASOS ACU V2.79S CDs, and copies of the DCP V2.0 EPROMs as well as the CL31 ceilometer delivered from WSH.
- Coordinate through the USAF Focal Point if problems are found during the OT&E.
- Submit completed questionnaires through the USAF Focal Points at the end of the OT&E.

4.2 Resource Requirements

Before OT&E activities can begin at a given site, the following resources must be in place:

Resource Requirements

Resource	Description
Hardware	<p>Before OT&E: temporary mounting equipment (for the test ceilometer) and associated hardware (to be purchased locally) must be in place as needed.</p> <p>For OT&E: ASOS DCP V2.0 EPROMS provided by NLSC.</p> <p>For OT&E: CL31 ceilometers and all required hardware “routine ordered” from NLSC and delivered to WFO’s (or USAF and U.S. Navy sites) responsible for installing CL31’s at the OT&E sites in their WFO area.</p>
Documentation	<ul style="list-style-type: none"> a. OT&E Plan b. Parts list/drawing package, and instructions for installing temporary mounts for the test ceilometer (prior to OT&E) c. Draft Mod Note 80 and 92 d. Vaisala CL31 Technical (Users) Manual e. Funding from OST11 for purchase of all hardware associated with building the temporary mount for the test ceilometer (prior to OT&E) f. TTR forms – Appendix B g. OT&E Questionnaire – Appendix E h. Inventory list of CL31 hardware, LRUs and spares at NLSC
Software	For OT&E: ASOS ACU V2.79S firmware provided on CD’s by W/OPS12/OPS24

4.3 TRG “Kick-Off” OT&E Meeting

The TRG Chair will conduct a TRG “kick-off” OT&E meeting. The “kick-off” meeting is held to determine if the prerequisites (Section 1.5.1) for the CL31 Ceilometer Replacement OT&E have been met and all OT&E resources are in place. The TRG will decide when to commence the OT&E.

4.4 Installation

Upon direction of the OT&E test director (See Section 3.2), the ASOS ET, from the WFO or office that is responsible for installation, will first install ASOS ACU V2.79S firmware and the DCP V2.0 EPROM following the draft NWS Mod Note 80 (NOTE: The ASOS firmware and NWS Mod Note will be shipped in advance to the NWS ETs. The DCP V2.0 EPROMs will come from the NLSC). This new software is identical to the current operational ACU firmware V2.79E and DCP V1.9 EPROMs with the exception it can support either the existing CT12K ceilometer or the CL31 ceilometer as the ASOS operational sensor. The ET will annotate the NWS Mod Note 80 with any recommended changes during the installation of the ASOS software. (NOTE: The ET will retain the previous version of ASOS software and DCP EPROMs during the OT&E in the event the site needs to revert back to this version as the operational version.)

For all sites, the NWS ET will install CL31 sensors and hardware shipped to the site as “initial issued” sensors from NLSC. The Mod Notes 92 (CL31) and Mode Note 80 (ACU Firmware DCP EPROMS Upgrade) will be provided to the ET’s at each OT&E site by the Site Focal Point (e-mailed to them from OPS12). The ET will install the CL31 sensor on the spare pedestal or temporary mount using Mod Note 92. The ET will annotate any changes required to the Mod Note

92 during the installation to improve the accuracy or completeness of instructions. After installation of the CL31 ceilometer is complete, the ET will record the installation in Engineering Management Reporting System (EMRS). The ET will complete the OT&E questionnaire (See Appendix E) at the end of the installation and, along with the annotated Mod Notes, provide both documents to the NWS Test Site Focal Point. The NWS Test Site Focal Point will forward these materials to the appropriate NWS Regional Focal Point for forwarding to the Test Director. The Test Director will provide the annotated Mod Notes to NWS OPS12 for incorporation into the final revision. The Test Director will collate all completed questionnaires for use in the test report.

CL31 ceilometer logistic spares (5 spares for each Lowest Replaceable Unit (LRU)) will be stocked at NLSC. If needed, the ET will order spares from NLSC. Repair of failed CL31 sensors, including ordering spares, will be accomplished using normal ASOS repair and replacement procedures. The ET will evaluate the process on the OT&E questionnaire.

4.5 Evaluation and Problem Reporting

To assess whether the CL31 ceilometer operates correctly and confirm no negative impact on operations, local users will evaluate the CL31 ceilometer performance first as a test sensor: the CT12K ceilometer will be the operational sensor that generates sky condition reports used in the METAR's/SPECI's. Then at a time to be determined by a Decision Point (DP), local users will evaluate the performance of the CL31 ceilometer as the operational sensor that generates sky condition reports used in METAR's/SPECI's (with the CT12K ceilometer as the test sensor).

The OT&E will last for a period of approximately three months during regular service operations. During the evaluation period, users will document and report any problems noted, as described in the following sections.

4.5.1 Evaluation

Since all OT&E sites are operational, the evaluation will consist of use of the CT12K ceilometer as the primary ceilometer for the first part of the OT&E, and the CL31 as the primary ceilometer during the second part of the OT&E. "Free play" review of displays and keyboard commands is acceptable.

The ET's will demonstrate the preventative maintenance (90-day) process during OT&E. During the 90 day preventative maintenance, the ET will also inspect the CL31 window, report on the condition of the CL31 window, and clean the CL31 window using the instructions in the draft Vaisala Technical (User) Manual. The ET's will also perform corrective maintenance if a failure of an LRU occurs. The ET's will use the draft Vaisala Technical (User) Manual to perform this maintenance. The ET will order the replacement LRU "out of stock" from the spares at NLSC. The ET will record all preventative maintenance and corrective maintenance (if needed) in EMRS.

A CT12K and CL31 Ceilometers Meteorological Comparison Evaluation (attached as an addendum to this OT&E plan) between the existing CT12K ceilometer and the new CL31 ceilometer will be conducted during ST using SFSC ASOS ST1, and possibly through the winter of 2008-2009 at a subset of OT&E sites. The purpose of the CT12K and CL31 ceilometers meteorological comparison evaluation is to assess the functional comparability of the ASOS algorithm output from the CL31 and CT12K ceilometers in weather conditions critical for

aviation services and weather forecasting. The NWS wants to ensure the replacement CL31 produces similar algorithm cloud reports to the existing CT12K ceilometer for the parameters defined in the evaluation plan. This evaluation is not a test, but a confidence building evaluation to quantify any differences between the ASOS sky condition algorithm cloud reports. If significant differences in the cloud reports from ASOS (CL31 vs. CT12K) are seen, these differences will be quantified, and an explanation will be given as to why there are differences.

At the conclusion of ST, the ATRB and TRG groups will decide whether to expand the meteorological comparison evaluation to a limited number of OT&E sites. This decision will be based on the number of cases obtained and the analysis of the results from the SFSC ST1 ASOS by the data analysis team, and confirmed by the TRG and ATRB.

If the ATRB decides to extend the CT12K and CL31 ceilometers meteorological comparison evaluation, it will be expanded to a subset of eight OT&E sites at the start of OT&E. Another important decision will be made during OT&E by members of the TRG and ATRB about when to switch the CL31 sensor from the test sensor to the primary (operational) sensor. The decision to switch the CL31 sensor from a test sensor to the primary (operational) sensor will also be based on the number cases obtained and the analysis of the results from the meteorological comparison evaluation by the data analysis team during the first part of the OT&E, and confirmed by the TRG and ATRB. If large differences are found between CT12K and the CL31 cloud reports and/or cloud amounts, a Technical Implementation Notice (TIN) describing these differences will be written by OPS22. The TIN will be distributed to all OT&E sites and to all ASOS sites upon at national deployment. The TIN will be provided to W/OS5 for coordination and distribution. Additional operational impact briefing materials and documentation may be prepared by W/OPS22, if necessary. In addition, the WFO will issue a Public Notification Statement (PNS) using the information in the TIN for ASOS in the WFO County Warning Area (CWA).

If functional changes in CT12K/CL31 cloud reports are noted prior to the second part of OT&E, when the CL31 is configured as the operational ceilometer, the WFO issued PNS will include the additional information. This will occur until all scheduled OT&E sites in their CWA have been implemented. The PNS for each site should be issued 48-72 hours prior to CL31 the switch of the CL31 ceilometer as the operational ceilometer. The following template shows an example of the TIN and should be modified as appropriate and used for the PNS.

NOUS41 KWBC 102220 PNSWSH
PUBLIC INFO. STATEMENT...TECHNICAL IMPLEMENTATION NOTICE 02-30A
NATIONAL WEATHER SERVICE HEADQUARTERS WASHINGTON DC 420 PM EST
MONDAY MARCH 10 2003

TO: FAMILY OF SERVICES /FOS/ SUBSCRIBERS...NOAA WEATHER WIRE
SERVICE /NWS/ SUBSCRIBERS...EMERGENCY MANAGERS WEATHER
INFORMATION NETWORK /EMWIN/ SUBSCRIBERS...OTHER NATIONAL WEATHER
SERVICE /NWS/ CUSTOMERS OF AVIATION DATA AND FORECASTS...NWS
EMPLOYEES

FROM: KEVIN SCHRAB CHIEF...OBSERVING SERVICES DIVISION

SUBJECT: AUTOMATED SURFACE OBSERVING SYSTEM /ASOS/ CEILOMETER
REPLACEMENT

THE FOLLOWING CHANGES HAVE NO DIRECT IMPACT ON NOAA WEATHER WIRE

SERVICE SUBSCRIBERS

THE AUTOMATED SURFACE OBSERVING SYSTEM /ASOS/ PRODUCT IMPROVEMENT PROGRAM WILL SOON DEPLOY A REPLACEMENT CEILOMETER...SKY CONDITION OBSERVING SENSOR. THE NEW SENSOR WILL REPORT SKY CONDITION INFORMATION USING.....

(Describe any significant results noted in the CL31 Ceilometer Meteorological Comparison Evaluation report.)

THE FOLLOWING ASOS LOCATIONS WILL TRANSITION TO THE NEW CEILOMETER CONFIGURATION ON THE INDICATED DATES:

(Insert the SID...STATION NAME...CONFIGURATION DEPLOYMENT DATE of the ASOS sites.)

IF YOU HAVE ANY QUESTIONS ABOUT THIS CHANGE...PLEASE CONTACT ONE OF THE FOLLOWING INDIVIDUALS AT NWS HEADQUARTERS:

LAURA A. COOK
SURFACE OBSERVATIONS PROGRAM MANAGER
PHONE: 301-713-1792 X 126
E-MAIL: LAURA.COOK@NOAA.GOV

OR

JOHN MONTE
ASOS PLANNED PRODUCT IMPROVEMENT PROGRAM MANAGER
PHONE: 301-713-1975 X160
E-MAIL: JOHN.MONTE@NOAA.GOV.

OR

DAVID MANNARANO
OFFICE OF OPERATIONAL SYSTEMS
PHONE: 301-713-2093 X 103
E-MAIL: DAVID.MANNARANO@NOAA.GOV

THIS AND OTHER NWS TECHNICAL IMPLEMENTATION NOTICES ARE AVAILABLE ON THE INTERNET AT /USE LOWER CASE/:

<http://www.nws.noaa.gov/om/notif.htm>

END \$\$ NNNN

4.5.2 Problem Reporting and OT&E Questionnaire

For the USAF and U.S. Navy sites, the users will report problems to the Site Focal Points on TTR forms (Appendix B), who will then forward the completed forms to the USAF Focal Point or U.S. Navy Focal Point. The USAF Focal Point and U.S. Navy Focal Point will submit the problems on TTR forms to the Test Director.

For NWS and FAA sites, users will report problems to the Site Focal Point on TTR forms, who will then forward the completed forms to the NWS regional focal points, who will forward the completed forms to the Test Director.

The Test Director will enter all received TRRs into the Test Track Pro database for retention. The Test Director will present all received TRRs to the TRG at its weekly meetings for review and adjudication.

At the conclusion of the evaluation period, the ETs, who performed the installations will complete the OT&E Questionnaire (Appendix E) and submit it to their appropriate OT&E focal point. The OT&E NWS Regional Focal Points, the FAA Focal Point, the USAF Focal Point, and the U.S. Navy Focal Point will pass them onto the Test Director.

4.6 OT&E Schedule

The OT&E will be conducted for approximately three months after the installation of the CL31 replacement ceilometers (initially as the test sensors) by the ET's are complete. At some point during OT&E, after a decision by the TRG and ATRB, the CL31 will be configured as the primary (operational) sensor, and the CT12K will be configured as the test sensor. This schedule is contingent on the completion of the ST, the availability of the NLSC stocked CL31 ceilometer hardware to support the OT&E, and the results of the CT12K/CL31 meteorological comparison evaluation. As a caveat, any critical problems deemed by the TRG will require a fix. A follow-on OT&E will be required to validate critical fixes.

4.7 Help during the OT&E

Questions regarding the OT&E should be directed to the Test Director:

Joseph Fiore
Phone: (301) 713-0326 x119
Cell: (703) 328-0746
Fax: (301) 713-0912
Email: joseph.fiore@noaa.gov

The WSH support staff is generally available on weekdays from 0800 to 1700 EDT.

4.8 Post-OT&E Activities

Unless a decision to the contrary is made by the TRG and ATRB, the CL31 ceilometers, ACU V2.79S firmware, and ASOS DCP V2.0 EPROMS will remain in place following the successful conclusion of the OT&E. In addition, if OT&E is successful, the NWS ET's will be instructed to pack up and ship existing CT12K ceilometers to NRC.

The Test Director will collate all received questionnaires; ensures NWS OPS12 receives all annotated draft NWS Mod Notes, and prepares the final list of TTRs documented during the OT&E with the TRG assigned priority and impact values.

5. Conclusions and Final Recommendation

The TRG Chair will convene a wrap-up meeting at the end of the evaluation period. The Test Director will review and present to the TRG the activities conducted to date, including a summary of TTRs documented and prioritized, and any other test findings. The TRG will review the information presented and recommend whether the OT&E is successful. The OT&E Test Director will report the conclusions and recommendation of the TRG to the ATRB. The ATRB will make the final decision on the OT&E. The ATRB Chair will report the ATRB decision to the ACCB as input into the ACCB's decision whether to implement the associated Request for Change for the ASOS CL31 Ceilometer Replacement.

6. OT&E Report

An OT&E Report will be prepared, by W/OPS24, upon completion of the OT&E, and will be reviewed and approved by the ATRB. The OT&E Report provides a complete record of the OT&E including details and status of all OT&E TTRs, findings, and recommendations. The OT&E Report will be made available on the W/OPS24 website.

Appendix A - OT&E site characteristics

Table A - OT&E Sites (NWS, FAA, NAVY, AIR FORCE)

Number	ASOS SITE ID	ASOS SITE NAME	AGENCY	NWS Region	ASOS Type	Spare Pedestal/ Temporary Mount	Number of. CL31 ceilometers
1	CMH	Columbus, OH	NWS	E	2 DCP	Not Required	1 primary 1 Met Disc
2	ROA	Roanoke, VA	NWS	E	2 DCP	Not Required	1 primary 1 back up
3	CAR	Caribou, ME	NWS	E	1 DCP	Temp	1 primary
4	BTV	Burlington, VT	NWS	E	1 DCP	Spare	1 primary
5	GDP	Guadalupe Pass, TX	NWS	S	1 DCP	Temp	1 primary
6	OKC	Oklahoma City, OK	NWS	S	1 DCP	Not Required	1 primary 1 back up
7	GUY	Guymon, OK	NWS	S	SCA	Spare	1 primary
8	JKL	Jackson, KY	NWS	C	1 DCP	Temp	1 primary
9	ABR	Aberdeen, SD	NWS	C	1 DCP	Spare	1 primary

10	ANJ	Sault Ste. Marie, MI	NWS	C	SCA	Temp	1 primary
11	BIS	Bismarck, ND	NWS	C	1 DCP	Temp	1 primary
12	CYS	Cheyenne, WY	NWS	C	1 DCP	Temp	1 primary
13	DDC	Dodge City, KS	NWS	C	1 DCP	Temp	1 primary
14	PHX	Phoenix, AZ	NWS	W	1 DCP	Not Required	1 primary 1 back up
15	HIO	Portland, OR	FAA	W	1 DCP	Temp	1 primary
16	CMA	Camarillo, CA	FAA	W	1 DCP	Spare	1 primary
17	OXR	Oxnard, CA	FAA	W	1 DCP	Spare	1 primary
18	GEG	Spokane, WA	FAA	W	1 DCP	Temp	1 primary
19	FAI	Fairbanks, AK	NWS	A	2 DCP	Temp	1 primary
20	ITO	Hilo, HI	NWS	P	1 DCP	Spare	1 primary
21	KNBC	Beaufort Marine Air Station, SC	NAVY	S	1 DCP	Temp	1 primary
22	KGFA	Malmstrom AFB, Great Falls, MT	AIR FORCE	W	SCA	Temp	1 primary

Table B - OT&E Site Operational Characteristics and Interfaces by NWS Region (22 Sites)

Eastern (4)

SID	Name	FAA Service Level	Observing Staff	NWS Region	DCPs	Multiple Sensors	Spare pedestal	Ice crystal	Met Comp	Comms	GTA/ ATIS	ACE	WSP	Current S/W Version
CMH	Columbus, OH	A	FT	E	2	M				DIAL	ATIS	ACE	---	2.79D
ROA	Roanoke, VA	C	PT	E	2	B	Y			ADAS	ATIS	---	---	2.79D
CAR	Caribou, ME	D	---	E	1	---		Y	Y	DIAL	GTA			2.79E
BTV	Burlington, VT	B	FT	E	1	---	Y			AWIPS	ATIS	---	---	2.79E

Southern (3)

SID	Name	FAA Service Level	Observing Staff	NWS Region	DCPs	Multiple Sensors	Spare pedestal	Ice crystal	Met Comp	Comms	GTA/ ATIS	ACE	WSP	Current S/W Version
GDP	Guadalupe Pass, TX	C	PT	S	1	---	-	Y	Y	DIAL	GTA	---	---	2.79E
OKC	Oklahoma City, OK	B	FT	S	1	B	Y			ADAS	ATIS	---	WSP	2.79D
GUY	Guymon, OK	D	---	S	SCA	---	Y			ADAS	GTA	---	---	2.79E

SID	Name	FAA Service Level	Observing Staff	NWS Region	DCPs	Multiple Sensors	Spare pedestal	Ice crystal	Met Comp	Comms	GTA/ ATIS	ACE	WSP	Current S/W Version
ABR	Aberdeen, SD	C	FT	C	1	B	Y			ADAS	ATIS	---	---	2.79D
ANJ	Sault Ste. Marie, MI	D	---	C	SCA	---				DIAL	GTA	---	---	2.79D
BIS	Bismarck, ND	C	PT	C	1	---	-	Y	Y	ADAS	ATIS	ACE	---	2.79D
CYS	Cheyenne, WY	C	PT	C	1	---	-			ADAS	ATIS		---	2.79D
DDC	Dodge City, KS	D	---	C	1	---	-			ADAS	GTA	ACE	---	2.79E
JKL	Jackson, KY	D	---	C	1	---	-		Y	ADAS	GTA	---	---	2.79D

Central (6)

Western (5)

SID	Name	FAA Service Level	Observing Staff	NWS Region	DCPs	Multiple Sensors	Spare pedestal	Ice crystal	Met Comp	Comms	GTA/ ATIS	ACE	WSP	Current S/W Version
PHX	Phoenix, AZ	A	FT	W	1	B	-		Y	ADAS	ATIS	ACE	---	2.79D
HIO	Portland, OR (FAA)	C	PT	W	1	---			Y	ADAS	ATIS	---	---	2.79D
CMA	Camarillo, CA (FAA)	C	PT	W	1	--	Y			ADAS	GTA	---	---	2.79D
OXR	Oxnard, CA	C	PT	W	1	---	Y			ADAS	ATIS		---	2.79D
GEG	Spokane, WA (FAA)	A	FT	W	1	---				ADAS	ATIS	ACE	WSP	2.79E

Alaska (1)

SID	Name	FAA Service Level	Observing Staff	NWS Region	DCPs	Multiple Sensors	Spare pedestal	Ice crystal	Met Comp	Comms	GTA/ ATIS	ACE	WSP	Current S/W Version
FAI	Fairbanks, AK	A	FT	A	2	--	-	Y	Y	ADAS	ATIS	-	---	2.79B

Pacific (1)

SID	Name	FAA Service Level	Observing Staff	NWS Region	DCPs	Multiple Sensors	Spare pedestal	Ice crystal	Met Comp	Comms	GTA/ ATIS	ACE	WSP	Current S/W Version
ITO	Hilo, HI	C	PT	P	2	---	Y		Y	DIAL	ATIS	ACE	---	2.79E

DoD Navy (1)

SID	Name	FAA Service Level	Observing Staff	NWS Region	DCPs	Multiple Sensors	Spare pedestal	Ice crystal	Met Comp	Comms	GTA/ ATIS	ACE	WSP	Current S/W Version
KNBC	Beaufort, SC	---	FT?	S	1	---	---			DIAL	ATIS	---	---	2.79D

DoD Air Force (1)

SID	Name	FAA Service Level	Observing Staff	NWS Region	DCPs	Multiple Sensors	Spare pedestal	Ice crystal	Met Comp	Comms	GTA/ ATIS	ACE	WSP	Current S/W Version
KGFA	Malmstrom AFB, Great Falls, MT	---	PT	W	SCA	---	---			DIAL	GTA (disabled)		---	2.79B

Appendix B - Test Trouble Report (TTR) form

ASOS TROUBLE REPORT

TYPE/NO _____ LOCATION (SID)

TROUBLE REPORT TITLE

DATE/TIME DISCOVERED _____ ORIGINATOR

AFFECTED SUBSYSTEM _____ S/W VER _____

A. DESCRIPTION AND CAUSE OF PROBLEM:

B. MAINTENANCE CONSULTED?

_____ YES _____ NO (WHY?)

C. PROBLEM NOTED ELSEWHERE?

_____ YES (WHERE?) _____ NO

D. TECHNICAL DATA ATTACHED?

_____ YES _____ PAGES

_____ NO

APPROVED _____ DATE

Appendix C - TRG and ATRB members

TRG Members

Name/Organization	Function	Vote
Joseph Fiore (W/OPS24)	Test Review Group Chair	-
Joseph Fiore (W/OPS24)	Test Director	✓
Greg Dalyai (W/OPS12)	Maintenance Branch	✓
Bing Huang (ATO-T)	FAA Focal Point	✓
Tim Rutkoswki (W/ER41)	Eastern Region ASOS Focal Point	✓
Lewis Harrington (W/SR41)	Southern Region ASOS Focal Point	✓
Bob Brashears (W/CR43)	Central Region ASOS Focal Point	✓
Son Nguyen (W/WR4)	Western Region ASOS Focal Point	✓
Jimmy Jones (W/AR42)	Alaska Region ASOS Focal Point	✓
John Bush (W/PR1)	Pacific Region ASOS Focal Point	✓
Christopher Kornkven (WFO MKE)	NWS Employee Organization Focal Point	✓
Kevin Conaty (W/CIO12)	AOMC	✓
Jim McNitt (W/OPS22)	ISSO (ASOS)	✓

ATRB Members

Name/Organization	Function	Vote
Jerald Dinges (W/OPS24)	ATR Chair/Primary	-
Joseph Fiore (W/OPS24)	DOC/NWS Secretariat/Alternate Chair/Primary	-
Khien Nguyen (W/OPS24)	DOC/NWS Secretariat Alternate	-
Dave Mannarano (W/OPS22)	DOC Primary	✓
Tom Townsend (W/CR1)	DOC Alternate	(✓)
Bing Huang (FAA- ATO-T)	FAA Primary	✓
Tugen Kieu (FAA-ATO-W)	FAA Alternate	(✓)
William Lawrence (USAF contractor HQ AFWA/A8PA)	USAF Primary	✓
Todd Allen (USAF YE-3)	USAF Alternate	(✓)
Gerald "Wayne" Knight (SPAWARSYSCEN)	US Navy Primary	✓
Ronald Heatherdale	US Navy Alternate	(✓)

(SPAWARSYSCEN)		
Roy Rasmussen (NCAR)	NCAR Primary	✓
Scott Landolt (NCAR)	NCAR Alternate	(✓)

Appendix D - Test personnel

Test Review Group Chair (OPS24):

Joseph Fiore
Test and Evaluation Branch (OPS24)
301-713-0326 x119
joseph.fiore@noaa.gov

ASOS Test Review Board (ATRB) Chair (OPS24):

Jerald Dinges
Chief, Test and Evaluation Branch (OPS24)
301-713-0326 x160
gerald.dinges@noaa.gov

OT&E Test Director (OPS24):

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Maintenance Branch (OPS12):

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Maintenance Branch (OPS12)
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ASOS ITSO (OPS22):

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Observing Systems Branch (OPS22)
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ASOS Operations Monitoring Center (AOMC)
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Barbra Childs (OPS22/SAIC)
703-661- 1283
barbra.childs@noaa.gov

Beth McNulty (OS23)

301-713-1726 x 116
beth.mcnulty@noaa.gov

NWS Regional Headquarters ASOS Focal Points:

Eastern Region	Tim Rutkoswki (W/ER41) timothy.rutkowski@noaa.gov	631-244-0139
Central Region	Bob Brashears (W/CR43) bob.brashears@noaa.gov	816-268-3161
Southern Region	Lewis Harrington (W/SR41) lewis.harrington@noaa.gov	817-978-7777 x 143
Western Region	Son Nguyen (W/WR4) son.m.nguyen@noaa.gov	801-524-5120 x 281
NWS Alaska Region	Jimmy Jones (W/AR42) jimmy.jones@noaa.gov	907-271-5124
NWS Pacific Region	John Bush (W/PR1) john.bush@noaa.gov	808-532-6435

NWSEO Focal Point (TBD)

NWS Central Region	Christopher Kornkven Chris.Kornkven@noaa.gov	262-965-5061 x 381
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FAA Focal Point (FAA Headquarters)

Bing Huang (ATO-T)	bing.huang@faa.gov	(208) 386-8579
Tuyen Kieu (ATO-W)	tuyen.kieu@faa.gov	(202)-267-9435

USAF Focal Point (USAF Headquarters)

William Lawrence	William.Lawrence.Ctr@offutt.af.mil	402-294-0866
------------------	--	--------------

NWS Test Site Focal Points (ESA):

<u>SITE</u>	<u>Focal Point</u>	<u>Telephone</u>
Hilo, HI (ITO)	Stephen Butler (Senior ET@ITO)	808-933-6987
Columbus, OH (CMH)	Curtis Brooks (ESA@ILN)	937-383-0031 x 228
Roanoke, VA (ROA)	William Riehl (ESA@RNK)	540-552-0084 x 228
Caribou, ME (CAR)	William Desjardins (Senior ST@CAR)	207-492-0180 x 228

Burlington, VT (BTV)	John Compo (ESA@BTV)	802-922-9138
Oklahoma City (OKC)	Jeff Engel (ESA@ OKC)	405-325-3567
Guymon, CO (GUY)	Ken Hunter (ESA@AMA)	806-335-2022 x228
Guadalupe Pass (GDP)	Wayne Patterson (ESA@MAF)	432-563-5960 x260
Jackson, KY (JKL)	Timothy Stanley (ESA@JKL)	606-666-5636 x 372
Aberdeen, SD (ABR)	Brian Ambuehl (ESA@ABR)	605-229-2389 x 372
Sault Ste. Marie, MI (ANJ)	Robert Weaver (ESA@ANJ)	989-731-1194 x 372
Bismarck, ND (BIS)	Karl Venneberg (ESA@BIS)	701-250-4224 x 372
Cheyenne, WY (CYS)	Michael Gillen (ESA@CYS)	307-772-2468 x 372
Dodge City, KS (DDC)	Michael Wagner (ESA@DDC)	620-225-6514 x 372
Phoenix, CA (PHX)	Frank Stewart (ESA@PHX)	602-275-7002 x 260
Portland, OR (HIO)	Bill Flieder (ESA@HIO)	503-326-2340 x 260
Camarillo, CA (CMA)	Gary Strickland (ESA@LOX)	805-988-6615 x 260
Oxnard, CA (OXR)	Gary Strickland (ESA@LOX)	805-988-6615 x 260
Spokane, WA (GEG)	Dwight Williams (ESA@OTX)	509-244-0110 x 260
Fairbanks, AK (FAI)	Randy Davis (ESA@AKZ))	907-458-3715
Beaufort Marine Air Station, SC (KNBC)	GySgt Rocky L. Alexander	843 228 7934
Malmstrom AFB, Great Falls, MT (KGFA)	Capt. Daniel MacKeen	406-731-3268

NWS Test Site Focal Points(OPL/OIC):

<u>SITE</u>	<u>Focal Point</u>	<u>Telephone</u>
Hilo, HI (ITO)	Thomas Stenman (OIC@HFO)	808-933-6941
Columbus, OH (CMH)	Donald Hughes (OPL@ILN)	937-383-0031 x 225
Roanoke, VA (ROA)	Roger Galloway (OPL@RNK)	540-552-0084 x 225
Caribou, ME (CAR)	Peter Rahe (OPL@CAR)	207-492-0180 x 225
Burlington, VT (BTV)	Gerald Macke (OPL@BTV)	802-862-8711 x 225
Oklahoma City (OKC)	Forrest Mitchell (OPL@OKC)	405-325-3408
Guymon, CO (GUY)	Tabatha Tripp (OPL@AMA)	806-335-1835 x 225
Guadalupe Pass (GDP)	Susan Griffin (OPL@MAF)	432-563-5901
Jackson, KY (JKL)	David Stamper (ESA@JKL)	606-666-2560 x 327
Aberdeen, SD (ABR)	Timothy Kearns (OPL@ABR)	605-225-0519
Sault Ste. Marie, MI (ANJ)	Keith Berger (OPL@)MPX)	989-731-1194 x 327
Bismarck, ND (BIS)	Leonard Peterson (OPL@BIS)	701-250-4224 x 327
Cheyenne, WY (CYS)	Arthur Hutcheon (OPL@CYS)	307-772-2468 x 327
Dodge City, KS (DDC)	Jesse Lee (OPL@DDC)	620-225-6514 x 276
Phoenix, CA (PHX)	Michael Bruce (OPL@PHX)	602-275-7002 x 225
Portland, OR (HIO)	Dan Keirns (OPL@HIO)	503-326-2340 x 225
Camarillo, CA (CMA)	Dessa Emch (OPL@LOX)	805-988-6615 x 225
Oxnard, CA (OXR)	Dessa Emch (OPL@LOX)	805-988-6615 x 225
Spokane, WA (GEG)	Robert Bonner (OPL@OTX)	509-244-0110 x 225
Fairbanks, AK (FAI)	Brad.Sipperley (OPL@FAI)	907- 458-3708
Beaufort MCAS, SC (KNBC)	SSgt Richard Robinson	843-228-7927
Beaufort MCAS, SC (KNBC)	CWO2 John Yukica (alternate)	843-228-7356
Malmstrom AFB, Great Falls, MT (KGFA)	MSgt Duane Bruce (alternate contact)	406-731-3267.

Appendix E - OT&E Questionnaire

CL31 Ceilometer Replacement OT&E Electronic Technician Questionnaire

(This survey is to be completed by the OT&E site during the OT&E, coordinating responses with the test site focal point).

Test Site: Name: Test Start Date: ASOS firmware version :	Date: Title: Test End Date:
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Respond to the statements below by checking the rating box that best describes your opinion according to the following code:

1 <u>Excellent</u> Performed in a manner that could not be improved	2 <u>Good</u> Performed well, met field needs and offered some improvements	3 <u>Satisfactory</u> Performed in a manner that meets basic field needs	4 <u>Deficient</u> Performed in unsatisfactory manner, does not fully meet field needs, may be workarounds	5 <u>Unsatisfactory</u> Performed in a wholly unsatisfactory manner, does not meet field needs and negatively impacts field operations	<u>N/A</u> Does Not Apply
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Statement/Question	1	2	3	4	5	N/A
Initial issuance of CL31 ceilometer from NLSC.						
Spare parts receipt from NLSC.						
AOMC Support needed?						
Installation of CL31 ceilometer using Modification Note 92. Installation of ACU firmware version V2.79S and DCP EPROMS version 2.0 using Modification Note 80. Did you find that the ceilometer installation Mode Note 92 was easy to follow? Did you find that the ACU firmware DCP EPROMS Update Mod Note 80 was easy to follow? How easy was it to install the CL31 ceilometer (s)? When the CL31 became the operational ceilometer was the transition smooth, and did the CL31 report accurate cloud reports? Was the Vaisala CL31 Technical Information Manual informative and helpful? Was the CL31 deployment process (from NLSC), receipt of ACU V2.79S firmware (on CD), and receipt of V2.0 EPROMS (from NLSC) satisfactory? If repairs were needed for the CL31 sensor, was the corrective maintenance process for getting repairs satisfactory and was it completed in a timely manner?						

Statement/Question	1	2	3	4	5	N/A
<p>If AOMC trouble reports were opened during CL31 OT&E, was the experience with AOMC positive, and was the trouble report resolved in a timely manner?</p> <p>Was the Preventative Maintenance section of the Vaisala Technical Manual easy to follow?</p> <p>If corrective maintenance was performed, did the Vaisala Technical Manual explain how to perform this maintenance in a satisfactory way?</p>						

Please provide any additional comments or information for any of the above questions.